

## Nantucket Biodiversity Initiative Invasive Plant Species Committee general recommendations for invasive plant species removal from wetlands and wetland buffers.

For the purposes of this document we define invasive species as *non-native organisms that in certain circumstances are able to proliferate and significantly alter or degrade natural communities, or threaten native species, by displacement, superior competitive interactions, modification of ecosystem processes, or predation, or cause high mortality of native species*. Some common attributes of invasive species include high reproductive rates, effective dispersal abilities, vegetative or clonal reproduction, habitat generalists, lack of effective predators, large range in area of origin, and high genetic variability. While certain native species can act invasively in some habitats, this document does not address such species. The Nantucket Wetlands Bylaw includes a list of invasive plant species found on Nantucket.

Conservationists frequently cite invasive species as second only to habitat loss as a threat to biodiversity. Perhaps more than 45% of federally listed endangered and threatened plant and animal species are threatened by invasive species<sup>i</sup>. It has been estimated that invasive non-native species cause environmental damages in excess of \$100 billion per year in the United States<sup>ii</sup>. Nationally, invasive plants are estimated to infest 100 million acres and are spreading across three million additional acres every year<sup>iii</sup>.

Invasive plants are becoming increasingly common in Nantucket's wetlands and wetland buffers and often threaten native wetland species and wetland functions. The Nantucket Biodiversity Initiative Invasive Plant Species Committee (IPSC) along with the Nantucket Conservation Commission (NCC) encourages land owners to control or remove invasive species from wetlands and wetland buffers when possible. The IPSC has prepared control/removal guidelines for several invasive species which can be obtained from the NCC. Appendix A includes a list of web based sources for information on invasive species control protocols.

This document outlines general guidelines for invasive species control and removal. The protocols that follow are based on the experience of IPSC members and information gathered from a variety of published sources. This document should not be viewed as the end all, be all of invasive species control. The science of invasive species control is rapidly evolving and new techniques are being developed on a regular basis. In addition, one size does not fit all and what works in one location may not work in another and, in many cases, a combination of removal techniques prove to be the most effective. In most cases, control or removal of invasive species requires a multi-year effort. Therefore, an adaptive management strategy that includes regular monitoring, evaluation, and modification is recommended for all invasive species removal projects. Only herbicides that are approved for use in or near wetlands should be considered.

Disposal of the viable portions of invasive species removed during the control effort is required to prevent establishment of new populations or reinfestation of the control area. The viable (capable of producing new plants) portions of invasive plants varies among species but can include seeds, stems, roots, and rhizomes. Disposal options include drying and burning, heat treatment, and disposal in the digester at the Town's Waste Management Facility. Viable portions of invasive plants should not be left on the ground, placed in brush piles, including the brush piles at the Town's Waste Management Facility, or placed in home compost piles unless it is certain that the pile reaches high temperatures (140°F).

## **General Invasive Species Control/Removal Guidelines.**

- 1) Delineate wetland margins and buffer zones according to NCC guidelines.
- 2) Identify invasive species and delineate extent of population according to NCC guidelines.
- 3) Survey the vegetation within and near the invasive species control area. Note any species of concern such as rare species or other invasive species. The presence of rare species will often require a more restrictive control regime.
- 4) Develop a control strategy. Control strategies must balance effective control of invasive species with protection of native organisms and the environment in general. We recommend starting with control techniques with few impacts to non-target organisms and the environment and adding other techniques as necessary. In most cases, early detection and removal is the best control option. Control strategies must include the appropriate disposal of viable portions of invasive plants removed during the control effort.
- 5) Develop a revegetation plan. In many cases, invasive plant removal results in the exposure of bare ground or the opening of a vegetative canopy leaving a site vulnerable to reinfestation. It may be appropriate to allow the surrounding native species to naturally revegetate the area, or it may be necessary to supplement the site with additional native plantings.
- 6) Monitor the effectiveness of the control effort on the target species, native species, and the environment. Prepare a report to the NCC following NCC reporting guidelines.
- 7) Modify control techniques as necessary.
- 8) Continue monitoring the site for a few years following successful removal of the invasive species to check for reinfestation.

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<sup>i</sup> Wilcove, D., D. Rothstein, J. Dubow, A. Phillips and E. Losos. 1998. Quantifying threats to imperiled species in the United States. *BioScience* 48:607-615. See also: Wilcove, D., D. Rothstein, J. Dubow, A. Phillips and E. Losos. 2000 Leading threats to biodiversity. In: *Precious heritage: The status of biodiversity in the United States*. The Nature Conservancy. Oxford University Press.

<sup>ii</sup> Pimentel, D., L. Lach, R. Zuniga, and D. Morisson. 2000. Environmental and economic costs of nonindigenous species in the United States. *BioScience* 50:53-56.

<sup>iii</sup> Bureau of Land management. 1996. *Partners against weeds – an action plan for the Bureau of Land Management*.

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## **Appendix A**

Massachusetts Pesticide Program

<http://www.mass.gov/agr/pesticides/>

iMap Invasives: The Nature Conservancy's Element Stewardship Extracts by species

<http://www.imapinvasives.org/GIST/ESA/index.html>

University of Connecticut's Invasive Plant Atlas of New England

<http://nbii-nin.ciesin.columbia.edu/ipane/>

Plant Conservation Alliance's Alien Plant Working Group

<http://www.nps.gov/plants/alien/factmain.htm>

The Red Weeder

<http://www.redweeder.com/>

New England Wild Flower Society Native Plant Sales

<http://www.newfs.org/store>

Nantucket Biodiversity Initiative's Invasive Plant Species Committee

<http://www.nantucketbiodiversityinitiative.org>

Morphological Differences Between Native and Introduced *Phragmites*

<http://www.invasiveplants.net/phragmites/morphology.htm>